

Extra 2.1 Questions Old Spec from paper 5

1.

The table below shows the classification of a sample of animals belonging to class Mammalia.

- (a) Each column represents a different taxon. Write the names of the taxa in the spaces available at the head of each column. [2]

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Carnivora	Canidae	Vulpes	vulpes
Carnivora	Canidae	Canis	lupus
Perissodactyla	Equidae	Equus	zebra
Perissodactyla	Equidae	Equus	asinus
Carnivora	Felidae	Felis	silvestris
Carnivora	Felidae	Panthera	tigris
Artiodactyla	Giraffidae	Giraffa	camelopardalis
Artiodactyla	Giraffidae	Okapia	johnstoni
Primates	Hominidae	Gorilla	gorilla
Primates	Hominidae	Homo	sapiens

- (b) (i) Explain what is meant by the binomial system for naming organisms. [2]

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- (ii) Give the binomial name of the tiger. [1]

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- (iii) Suggest binomial names for [1]

Zebra,

Gorilla.

01)

- (c) The diagram below shows the results of tests used to find out how closely related some of the animals are. Samples of ribosomal RNA from the animals were mixed with restriction enzymes, placed in the wells labelled **A, B, C, D, E**, and an electrical current applied.

(i) Name this technique.

[1]

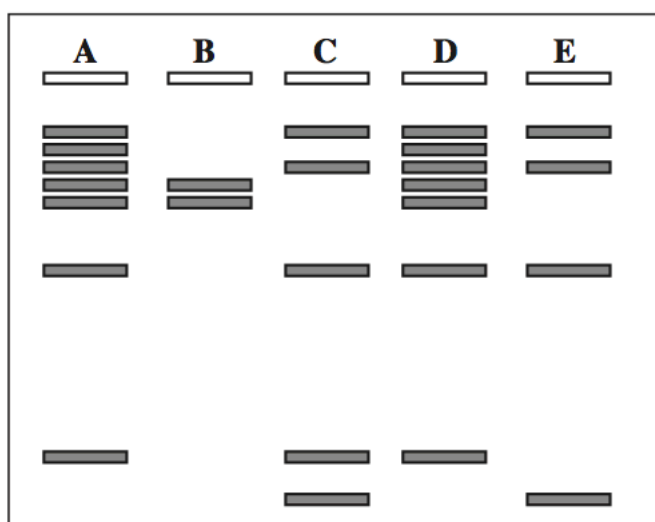
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(ii) What purpose did the restriction enzymes perform?

[2]

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- (iii) Which **two** animals in the table opposite are most likely to have provided samples **A** and **D**? [1]

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(iv) Explain your answer to part (c) (iii).

[2]

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(Total 12 marks)

2.

(a) Complete the following table to show the classification of the Tiger, *Panthera tigris*. [6]

Kingdom	Animalia
Phylum	
Class	
	Carnivora
	Felidae
Genus	
Species	

(b) Suggest how DNA data can provide evidence for the evolutionary relationship between organisms. [1]

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(Total 7 marks)

3.

In Africa, Lake Nabugabob separated from Lake Victoria thousands of years ago.

There are five species of cichlid fish of the genus *Haplochromis* in Lake Nabugabob, each descended from a different species in the main lake, Lake Victoria.

- (a) Name the Phylum and Class to which these cichlid fish belong. [2]

Phylum

Class

- (b) Explain why the fish from each lake can be described as different species. [2]

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- (c) Suggest how analysis of DNA or proteins might be used to supply additional evidence that the Lake Nabugabob fish have descended from ancestors in Lake Victoria. [2]

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- (d) Explain how the splitting of the fish population into Lake Nabugabob and Lake Victoria populations has led to the formation of the separate species. [4]

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(Total 10 marks)

4.

There are seven taxonomic groups used in biological classification. The classification groups of the tiger are listed below but not in the correct sequence.

<i>Number</i>	<i>Taxonomic group</i>	<i>Classification of tiger</i>
1	genus	Panthera
2	kingdom	Animalia
3	species	tigris
4	class	Mammalia
5	phylum	Chordata
6	family	Felidae
7	order	Carnivora

- (a) Using the numbers 1-7, place the taxonomic groups in the correct sequence starting with the highest group. The first one has been done for you. [1]

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- (b) List the **four** kingdoms that contain eukaryotic organisms. [4]

1.
2.
3.
4.

(c) State **three** features of the kingdom prokaryotae. [3]

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2.

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3.

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(d) Lions and tigers can interbreed together producing offspring. Suggest why lions and tigers are considered as separate species. [1]

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(Total 9 marks)

5.

The modern system of classification has five Kingdoms.

(a) Name the five Kingdoms. [2]

(b) (i) Write the following taxa in order of size starting with the largest group and ending with the smallest group. [2]

order, genus, phylum, class, family.

(ii) Give **one** reason why the tiger is placed in order Carnivora. [1]

(iii) Give **one** reason why the tiger is placed in family Felidae. [1]

(c) According to the binomial system, the tiger is named *Panthera tigris*.

(i) Which **two** taxa are used in the binomial system to name a particular organism? [2]

(ii) Why is the binomial system important to the international scientific community? [1]

(Total 9 marks)

6.

The cultivated banana is sterile and seedless. It reproduces asexually, producing shoots or suckers that develop into new plants. It is extremely difficult to develop disease-resistant varieties of this plant.

In the 1950s the main variety grown in banana plantations was Gros Michel. This variety was totally wiped out by Panama disease, caused by a soil fungus (*Fusarium oxysporum*). The disease spread rapidly from one plant to another and from plantation to plantation.

Following the devastation, a variety of banana that was resistant to Panama disease, Cavendish, was planted and has been used ever since. However, it became apparent that Cavendish was susceptible to the disease, Sigatoka, caused by another fungus (*Mycosphaerella fijiensis*). Only the use of massive amounts of fungicide spray is keeping Sigatoka under control. It seems that as soon as a new fungicide is used the fungus develops resistance to it.

(a) State the type of cell division used in the reproduction of the banana plant. [1]

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(b) (i) State the **genus** of the fungus that causes Panama disease. [1]

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(ii) Explain why Panama disease spread so quickly through the banana plantations and wiped out the Gros Michel variety in the 1950s. [3]

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(c) Explain how the fungus that causes Sigatoka becomes resistant to fungicides. [5]

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(d) (i) Explain why it is so difficult to develop disease-resistant varieties of banana. [2]

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(ii) Suggest a way by which disease resistance could be achieved. [1]

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(Total 13 marks)